[0112] Each of mobile devices belonging to a D2D communications group may transmit its coordinates along with coordinates of each of adjacent mobile devices received therefrom to other mobile devices.

[0113] Accordingly, a mobile device within the coverage of the base station **710** may transmit its coordinates along with the coordinates of each of the mobile devices belonging to the D2D communications group collected by hopping to the base station **710** (step **S810**).

[0114] A management server may receive the coordinates of each of the plurality of mobile devices via the base station **710** and may create a dynamic mesh map based on the coordinates of the mobile devices belonging to the D2D communications group (step **S820**).

[0115] Subsequently, a variety of optional, location-based services may be provided by using the dynamic mesh map (step **S830**). For example, marketing information such as famous restaurants, theaters, etc., near a user carrying the mobile device may be provided.

[0116] FIG. **9** is a block diagram illustrating a mobile device according to an exemplary embodiment of the present disclosure.

[0117] A mobile device **900** according to an exemplary embodiment of the present disclosure may include a communicating unit **910**, a channel model selecting unit **920**, a distance calculating unit **930**, and a coordinate calculating unit **940**.

[0118] It is to be noted that FIG. **9** only shows the elements related to this exemplary embodiment. Accordingly, those skilled in the art would understand that the mobile device **900** may further include other elements in addition to those shown in FIG. **9**.

[0119] The communicating unit **910** receives coordinates of each of adjacent mobile devices therefrom. The communicating unit **910** may receive the coordinates of each of the adjacent mobile devices via a D2D communications channel based on a LTE link.

[0120] The channel model selecting unit **920** estimates a channel environment to select an optimal channel model for the environment. Specifically, the channel model selecting unit **920** may include a coherent transceiver (not shown). The coherent transceiver may estimate the channel environment via multipath signal tracking.

[0121] The distance calculating unit **930** calculates distance between the mobile device **900** and each of the adjacent mobile devices by using the selected channel model. Once the distance between the mobile device **900** and each of the adjacent mobile devices is calculated, the coordinate calculating unit **940** calculates the coordinates corresponding to the current position of the mobile device **900** by using the calculated distance.

[0122] If the coordinates of each of the adjacent mobile devices are not received, the mobile device **900** may turn on a location tracking unit (not shown) to acquire coordinates corresponding to the current position, and then may broadcast the acquired coordinates corresponding to the current position of the mobile device **900** to the adjacent mobile devices.

[0123] According to an exemplary embodiment of the present disclosure, the location tracking unit may be a GPS mobile device or a Wi-Fi module. However, any other device may be used as the location tracking unit as long as it has the capability of acquiring coordinates corresponding to the current position.

[0124] As described above, by acquiring the coordinates corresponding to the current position by using the coordinates of each of the adjacent mobile devices and the distance between the mobile device and each of the adjacent mobile devices, it is possible to acquire the coordinates more accurately.

[0125] FIG. **10** is a block diagram illustrating a mobile device according to still another exemplary embodiment of the present disclosure.

[0126] A mobile device **1000** shown in FIG. **10** includes a processor **1010**, a memory **1020**, storage **1030**, a network interface **1040**, and a bus.

[0127] It is to be noted that FIG. **10** only shows the elements related to this exemplary embodiment. Accordingly, those skilled in the art would understand that the mobile device **1000** may further include other elements in addition to those shown in FIG. **10**.

[0128] The processor **1010** executes a program capable of tracking a user's location. However, the program executed on the processor **1010** is not limited thereto but may include any of widely used programs.

[0129] The memory **1020** may load a program capable of tracking a user's location so that the program is executed on the processor **1010**.

[0130] The storage **1030** stores a program capable of tracking a user's location therein. In addition, the storage **1030** may store information on optimal channel models for channel factors therein. The program for tracking a user's location causes the processor to perform the operations of: receiving coordinates of each of adjacent mobile devices therefrom; estimating a channel environment to select an optimal channel model; calculating distance between the user's mobile device and each of the adjacent mobile devices based on the selected channel model; and calculating coordinates corresponding to the current position of the mobile device based on the distance between the mobile device and each of the adjacent mobile devices.

[0131] The network interface **1040** may be connected to another mobile device. The network interface **1040** according to an exemplary embodiment may be connected to another mobile device via a D2D communications channel based on a LTE link

[0132] The bus **1050** works as a data transfer path among the processing **1010**, the memory **1020**, the storage **1030** and the network interface **1040**.

[0133] The method for tracking user's location according to the present invention can be recorded in programs that can be executed on a computer and be implemented through general purpose digital computers. In addition, the data format used in the method for for generating the web page according to the present invention may be recorded in a computer-readable recording medium using various means. Examples of the computer-readable recording medium may include recording media such as magnetic storage media (e.g., ROMs, floppy disks, hard disks, etc.) and optical recording media (e.g., CD-ROMs or DVDs).

[0134] While the present invention has been particularly shown and described with reference to exemplary embodiments thereof, it will be understood by those of ordinary skill in the art that various changes in form and details may be made therein without departing from the spirit and scope of the present invention as defined by the following claims. It is therefore desired that the present embodiments be considered in all respects as illustrative and not restrictive,